REMARKS

The Specification's references to several pending patent applications have been updated by this amendment.

A minor text error on page 2 is corrected by this amendment.

Claim 10 has been cancelled, making the Examiner's objections to that claim moot.

Claim 33 has been amended to correct the informality noted by the Examiner, as well as to further distinguish over the cited art.

Claims 1 through 4, 7, 14 through 16, 19, 25 through 28 and 31 are rejected under 35 U.S.C. 102(e) as anticipated by Lei, U.S. Patent 6,130, 911(Lei I).

Claims 32 and 34 are rejected under 35 U.S.C. 102(e) as anticipated by Lei, U.S. Patent 6,272,180 B1 (Lei II).

Claims 8 through 10, 12, 13, 20, 21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lei I in view of Liu et al., U.S. Patent No. 5,970,233 (Liu).

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lei I in view of Koppelmans et al., U.S. Patent No. 5,544,266 (Koppelmans).

Claims 5, 17, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lei I in view of Goertzen, U.S. Patent 6,289,132 (Goertzen).

Claims 6,18 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lei I and Liu

Claims 11 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentbale over Lei , Liu and Goertzen.

Claims 1, 8, 14, 20, 25, and 32 through 34 are amended by this Amendment. As amended, applicants believe that none of the cited references anticipate any of these independent claims and that no combination of the cited references makes any of them obvious.

13

The claimed embodiments of the present invention uses temporary compression of portions of an image during the overall compression of the complete sequence of images to reduce the amount of temporary storage needed during both the compression and decompression of video images. Incoming image data is processed and compressed block-by-block and placed in temporary storage and then decompressed for comparison with subsequent blocks before the eventual final compression of the information. This comparison occurs in a transform domain, which further reduces the need for temporary storage space for these blocks. Temporary block-by-block compression and the temporal compression of these blocks (between frames, for example) not only allows for a reduction in the temporary storage needed, but also takes advantage of the relationship between associated blocks of an image in order to produce a better picture when the information is finally decompressed.

This first embodiment compresses data block-by-block and placed in temporary storage. A corresponding block of a later frame is also compressed. Both blocks are decoded back into the transform domain and the two blocks are compared in the transform domain using a Haar transform. The block resulting from this comparison in the transform domain can then be encoded and output in a more compressed form.

None of the cited references describes a compression/decompression device or method which anticipates the method and apparatus now claimed in amended independent claims 1, 8, 14, 20, 25 and 32 through 34.

Lei I nowhere describes or even mentions operating on the blocks that comprise a frame of video information. Lei I specifically states that it provides a method and apparatus for compressing reference frames in any interframe image coding and decoding system. Lei I also specifically works on all the blocks of a first image before beginning to encode the blocks of a second image frame (see Lei I, col. 6, lines 20-22). The operation of the present invention, where a series of first and second blocks are compressed, transformed and encoded, and then decoded and compared in the transform domain is nowhere even hinted at in Lei I. Lei I can thus not anticipate any of the independent claims, as amended by this Amendment.

Lei II presents a method for compressing a digital image wherein a block of data from a digital image is wavelet transformed to generate a multiple-subband transform coefficient array. The coefficients of the transform coefficient array are then reordered so as to group coefficient subbands with similar expected bit-level run-length statistics together. The reordered coefficients are then coded using an embedded run-length encoder. This method does not anticipate nor even suggest compressing, transforming and encoding a series of first and second blocks of video data from a frame of a video image, then decoding this series in a transform

14

domain wherein a further comparison of the first and second blocks in the transform domain results in additional image compression with improved video quality when the image is decompressed by reversing the enumerated process. Although Lei II is in the same field as the present invention, as indeed is Lei I, and although Lei II and Lei I are both striving to improve the compression/decompression of video information, the methods described in these references never describe operating upon successive first and second blocks of video information from the same frame of video information in a transform domain to further compress a combination of these first and second blocks. With no explicit teaching or even a suggestion of the desirability of such a method of operation, neither Lei I nor Lei II alone or in combination anticipates the present invention as now claimed in the independent claims as herein amended.

Liu describes a system for processing video data wherein video data encoded in a first format is decoded by a first decoder and video data encoded in a second format is decoded by a second decoder. This two-path decoder system bears no resemblance to the present invention as set forth in the amended dependent claims. The two different formats of video data requiring two different video decoders cannot function similarly to the present invention, where a series of first and second blocks are compressed, transformed and encoded, and then decoded and compared in the transform domain. Liu thus does not anticipate any of the independent claims.

Koppelmans was cited for disclosing "well known concept of partially compressing the decompressed blocks (col. 7, lines 55-59)..." Even if it were conceded that Koppelmans does suggest partially compressing decompressed blocks, the reference does not describe the method and apparatus herein claimed, wherein compressed, transformed and encoded successive first and second blocks are partially decompressed but then compared to one another in a transform domain. Absent such teaching, Koppelmans, even when combined with Lei I cannot make any of the independent claims herein obvious.

Goertzen describes a image-processing module for compressing interlaced images. The interlaced image, which is comprised of two fields is processed to produce a reference field and an error field. The reference field corresponds to the still image content of the interlaced frame and the error field corresponds to the motion content of the interlaced frame, particularly the motion between the fields. As with all the previously discussed cited art, Goertzen nowhere describes or even suggests a system in any manner similar to that claimed as the present invention, wherein a series of first and second blocks are compressed, transformed and encoded, and then decoded and compared in the transform domain to generate the final compressed video information.

15

As none of the references anticipates any one of the amended independent claims, none of the references even suggesting block-by-block operation on a succession of first and second blocks, particularly the aspect of comparing partially decompressed first and second blocks in the transform domain to yield the final compressed block of video data, all of which improves the final image resulting after decompressing the video data using the present invention, the rejection of the claims under 35 U.S.C. §102(e) must be withdrawn. Similarly, as no reference alone suggests the claimed block-by-block operation of the present invention, together they cannot make any of the independent claims obvious. Therefore, the rejection of the claims, both independent and dependent, under 35 U.S.C. §103(a) must also be withdrawn.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP

L. Krqam Thomas, Reg. No. 32,947

for Jonathan O. Scott
Reg. No. 39,364

P.O. Box 778
Berkeley, CA 94704-0778
(650) 961-8300

16